

FINAL REPORT
Interactive Learning During Solar Maximum
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Brief Proposal Summary

The goal of this project is to develop and distribute e-educational material for space science during times of solar activity that emphasizes underlying basic science principles of solar disturbances and their effects on Earth. This includes materials such as simulations, animations, group projects and other on-line materials to be used by students either in high school or at the introductory college level. The on-line delivery tool originally intended to be used is known as Interactive Multimedia Education at a Distance (IMED), which is a web-based software system used at UCLA for interactive distance learning. IMED is a password controlled system that allows students to access text, images, bulletin boards, chat rooms, animation, simulations and individual student web sites to study science and to collaborate on group projects.

Original Work Plan

The goal of this project was to create electronic course materials to be made available to different high schools and colleges in California. Specifically the course material was to be about solar activity and solar storms. After a solar disturbance had occurred, we would construct instructional packages that followed the progress of the solar disturbance and its effects on the Earth's space environment. These packages would include data such as x-ray and solar energetic particle signatures from various satellites including solar wind monitors (e.g., Wind, ACE) and examine precursors of magnetic activity at Earth. Satellite data from geosynchronous satellites and ground-based magnetometers would also be used to gauge the geo-effectiveness of different magnetic storms. Students would then use these instructional packages in class via IMED and prepare reports as part of a team project. When several instructional packages had been developed for different solar disturbances, a virtual workshop would be held between different schools analyzing, comparing and discussing the different events.

Progress

Instructional packages for different solar events have been developed. This includes the solar disturbances on October 22, 1999 and July 14, 2000, which are essentially complete. Packages for other solar events are still in the process of being developed for solar disturbances on October 1, 1997, May 2, 1998, August 26, 1998 and September 25, 1998. Once these are finished a total of 6 events will be ready for distribution. These various events were chosen because they covered a wide range of solar disturbances and the level of geo-effectiveness at Earth was quite different. Thus a good degree of analysis will be required when examining the different events and the conclusions drawn by the students should be quite interesting.

We are in the process of distributing these instructional packages to high schools and including the materials in the science curriculum. To this end, we have formed a collaboration with the

University of California College Prep (UCCP) initiative to develop on-line educational materials for Advanced Placement (AP) high school courses. Thus the on-line distribution mechanism for high schools would be through a set of AP courses offered by UCCP using Internet 2 lines available free of charge at all California high schools. We are presently developing an on-line AP Environment Science course for UCCP and a prototype of this web site can be viewed at <http://psi.cdi.ucla.edu/enviroscience> using "student" for both the login and password. The on-line Environmental Science course will be completed in February 2002 and we will then begin developing an on-line AP Physics course that will directly incorporate the educational packages we have developed as described for this ISTP outreach program. Although we had originally envisioned distributing these materials to high schools with IMED, going through UCCP AP on-line will reach a much larger number of high schools with greater bandwidth. These materials will also be made available to colleges using IMED. The completion of the AP on-line course materials for Environmental Science and Physics is set for early to mid 2002 with initial use of the materials in high schools starting in the academic year 2002 in September. It is then that the ISTP Outreach educational materials will be used by high school students as originally planned.

Presentations

Ashour-Abdalla, M., D. Schriver, V. Perroomian, H. Matsumoto, M. Minoh, H. Kojima, H. Usui, Transpacific Interactive Distance Education (TIDE), *American Geophysical Union*, San Francisco, CA, December 2000 (EOS, 81, F288).

Ashour-Abdalla, M., D. Schriver, J. Berchem, and S. Peterson, Environmental Science On-Line (ESOL), *University California Santa Cruz*, Santa Cruz, CA, July 2001.

Websites

<http://psi.cdi.ucla.edu/enviroscience>

(Use "student" for both the login and password)

<http://imed.cdi.ucla.edu>

(Use "cdi" for both the login and password and then click on Course: SpaceHnr77)